

933.057



# PATENT SPECIFICATION

NO DRAWINGS

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## COMPLETE SPECIFICATION

### Improvements relating to Hydrocarbon Fuels

- We, THE BRITISH PETROLEUM COMPANY LIMITED, of Britannic House, Finsbury Circus, London E.C.2, a British joint-stock Corporation, and RONALD ALFRED DEAN and PATRICK GOULD, both of the Company's Research Centre, Chertsey Road, Sunbury-on-Thames, Middlesex, and both of British nationality, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- This invention relates to hydrocarbon distillate fuels boiling in the gas oil range.
- In cold weather, difficulties are often encountered in the operation of diesel engines running on hydrocarbon fuels, such as gas oils, owing to the separation of wax from the fuel which may cause blockage of the fuel pipes and filters. This difficulty is most frequently encountered with better quality gas oils, which, owing to their higher paraffinic content, have a greater tendency to precipitate wax than poorer quality gas oils.
- We have now found that the low temperature properties of certain hydrocarbon fuels can be improved by adding to the fuel a particular type of additive.
- According to the invention, there is provided a fuel composition consisting essentially of a gas oil having an initial boiling point not substantially higher than 250°C and a final boiling point not substantially lower than 330°C and containing at least 0.1% wt of *n*-paraffins higher than C<sub>22</sub>, the said gas oil having dissolved therein 0.05—0.5, preferably 0.05—0.2, % by weight of the composition of a fatty acid or mixture of fatty acids having 10—30 carbon atoms.
- The fatty acid or mixture of fatty acids may be, for example, stearic acid, fatty acid residual flake (a mixture of fatty acids containing a high proportion of the normal acid with 20 carbon atoms) or wool wax fatty acid (a mixture of saturated and unsaturated fatty acids having 10—30 carbon atoms).
- By way of example, the pour point and low temperature filterability of a number of fuel compositions according to the invention and of the gas oils used in them, were tested. The pour points of the fuels were determined by the British Institute of Petroleum's standard method no. 15. The low temperature filterability was determined by the Hagemann and Hammerich test (German standard specification DIN 51770). In this test a specified quantity of the fuel is passed through a standard filter at a pressure of 0.5 atmospheres gauge and the result is reported as the lowest temperature at which the fuel will pass through the filter within one minute.

The fuel compositions used were:—

Fuel Composition		% weight
A1	Gas oil A	99.9
	Pure stearic acid	0.1
A2	Gas oil A	99.9
	Commercial stearic acid	0.1
A3	Gas oil A	99.8
	Commercial stearic acid	0.2
A4	Gas oil A	99.9
	Fatty acid residual flake	0.1
A5	Gas oil A	99.9
	Wool wax fatty acid	0.1
A6	Gas oil A	99.8
	Wool wax fatty acid	0.2
B	Gas oil B	99.9
	Pure stearic acid	0.1

The gas oils used in the compositions were obtained from Middle East crude oils and had the following properties:—

	Gas Oil A	Gas Oil B
Distillation range: °C.	200 — 370	196 — 367
Specific Gravity: 60/60° F.	0.83	0.83
Sulphur Content: % wt.	0.33	0.83
Wax Content: % wt.	4.0	3.2
Content of <i>n</i> -paraffins above C <sub>22</sub> : % wt.	1.1	0.47
Diesel Index	Not determined	61/62

The results of the tests were as follows:—

	Pour Point: °C.	Filtration Test: °C.
Gas Oil A	−12.2	−8
Fuel Composition A1	−15	<−25
” ” A2	−17.8	<−24
” ” A3	−15	Not determined
” ” A4	−12.2	<−24
” ” A5	−15	<−25
” ” A6	−17.8	Not determined
Gas Oil B	−15	−11
Fuel composition B	Not determined	<−23

WHAT WE CLAIM IS:—

1. A fuel composition consisting essentially of a gas oil having an initial boiling point not substantially higher than 250°C and a final boiling point not substantially lower than 330°C and containing at least 0.1% wt of *n*-paraffins higher than C<sub>22</sub>, the said gas oil having dissolved therein 0.05—0.5% by weight of the composition of a fatty acid or mixture of fatty acids having 10—30 carbon atoms.
2. A fuel composition according to Claim 1,

in which the amount of the said fatty acids is 0.05—0.2% by weight of the composition.

3. A fuel composition according to Claim 1 or Claim 2, in which the said fatty acid or mixture of fatty acids is stearic acid, fatty acid residual flake or wool wax fatty acid.
4. Fuel composition A1, A2, A3, A4, A5, A6 or B as hereinbefore specified.

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